

2 --~~41~~¹. The apparatus of claim ~~40~~¹ wherein the impeller comprises at least 3 blades.--

3 --~~42~~². The apparatus of claim ~~41~~² wherein the impeller has 4 blades.--

4 --~~43~~¹. The apparatus of claim ~~40~~¹ wherein a plurality of magnets is disposed within each blade.--

5 --~~44~~¹. The apparatus of claim ~~40~~¹ wherein a single magnet is disposed within each blade.--

6 --~~45~~¹. The apparatus of claim ~~40~~¹ wherein the blades are separated by channels extending from a first face to an opposing second face of the impeller.--

7 --~~46~~⁶. The apparatus of claim ~~45~~⁶ wherein the second face of the impeller includes a plurality of tapered surfaces forming the hydrodynamic bearing surface.--

8 --~~47~~¹. The apparatus of claim ~~40~~¹ wherein the apparatus further comprises:
a shaft coupled to a center of a face of the impeller, the shaft axially aligned with the impeller axis of rotation.--

9 --48. A blood pump apparatus comprising:

an impeller having a hydrodynamic bearing surface and a plurality of channels extending substantially radially from a center to a periphery of the impeller; and

a plurality of magnets, each magnet disposed within the impeller between a pair of channels, wherein an axis of magnetization of the magnets is substantially parallel to an impeller axis of rotation.--

10 --49. The apparatus of claim ⁹48 wherein the impeller comprises at least 3 channels.--

11 --50. The apparatus of claim ¹⁰49 wherein the impeller comprises 4 channels.--

12 --51. The apparatus of claim ⁹48 wherein the channels extend from a first face to an opposing second face of the impeller.--

13 --52. The apparatus of claim ¹²51 wherein the second face of the impeller includes a plurality of tapered surfaces forming the hydrodynamic bearing surface.--

14 --53. The apparatus of claim ⁹48 wherein a plurality of magnets is disposed within each blade.--

15 --⁹54. The apparatus of claim ⁹48 wherein a single magnet is disposed within each blade.--

16 --⁹55. The apparatus of claim ⁹48 wherein the apparatus further comprises:
a shaft coupled to a center of a face of the impeller, the shaft axially aligned with the impeller axis of rotation.--

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17 --56. A blood pump apparatus, comprising:
an impeller having a hydrodynamic bearing surface; and
a first stator and a second stator, wherein the impeller is disposed axially between the first and second stators, wherein the impeller and stators form an axial flux gap motor.--

18 --¹⁷57. The apparatus of claim ¹⁷56 wherein the impeller further comprises a plurality of magnets; each magnet having a magnetic axis substantially parallel to an impeller axis of rotation.--

19 --¹⁸58. The apparatus of claim ¹⁸57 wherein the magnets are disposed within blades of the impeller.--

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20 --~~59~~. The apparatus of claim ~~57~~ wherein the impeller comprises a plurality of channels extending from a center to a periphery of the impeller.--

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23 --~~60~~. The apparatus of claim ~~59~~ having at least 3 channels.--

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24 --~~61~~. The apparatus of claim ~~59~~ having 4 channels.--

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21 --~~62~~. The apparatus of claim ~~58~~ wherein a plurality of magnets is disposed within each blade.--

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22 --~~63~~. The apparatus of claim ~~58~~ wherein a single magnet is disposed within each blade.--

25 --~~64~~. A blood pump apparatus, comprising:

a housing defining a volute, and

an impeller, the impeller having a hydrodynamic bearing to provide axial support,
the impeller having a magnetic bearing to provide radial support.--

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26 --~~65~~. The apparatus of claim ~~64~~ wherein the impeller further comprises a plurality of magnets, each magnet having a magnetic axis substantially parallel to an impeller axis of rotation.--

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27 --~~66~~. The apparatus of claim ~~65~~²⁶ wherein the magnets are disposed within blades of the impeller.--

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28 --~~67~~. The apparatus of claim ~~65~~²⁶ wherein the impeller comprises a plurality of channels extending from a center to a periphery of the impeller.--

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31 --~~68~~. The apparatus of claim ~~67~~²⁸ having at least 3 channels.--

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32 --~~69~~. The apparatus of claim ~~67~~²⁸ having 4 channels.--

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29 --~~70~~. The apparatus of claim ~~66~~²⁷ wherein a plurality of magnets is disposed within each blade.--

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30 --~~71~~. The apparatus of claim ~~66~~²⁷ wherein a single magnet is disposed within each blade.--

REMARKS

Claim 1 has been cancelled and claims 40-71 are presented. Applicant encloses a *Patent Application Fee Determination Record* (form PTO/SB/O6) and a check for \$147. The Commissioner is hereby authorized to credit any overpayment or charge any fee for additional claims to deposit account no. 07-1141.

Examination on the merits of this application is respectfully requested.

Respectfully submitted,



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